Selecting Water Budget Years for Generation of Starting Heads

Presented by Jennifer Sukow

March 14, 2011

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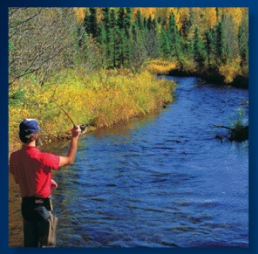

Calibration Issues (Feb 2011)

- Starting heads are too high for model to overcome during 5-year warm-up period, so model reduces recharge and removes excessive amount of water from storage between 1980 and 2001
- Starting heads for transient analysis were generated using steady state simulation with water budget data from May 1981-April 1984
- Average annual recharge (May 1981- Apr 1984) to the model domain (2/14/2011 run) was 6.0 MAF

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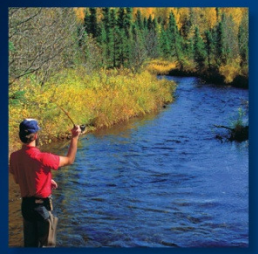
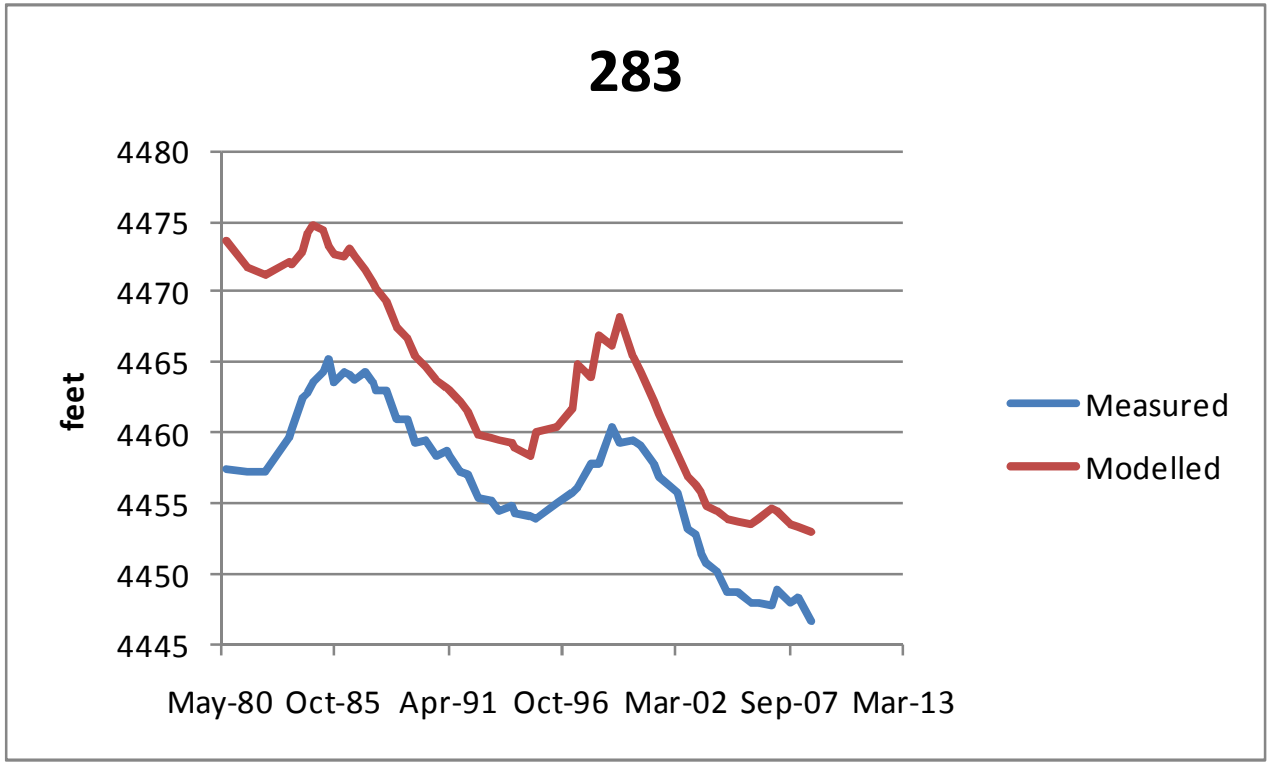
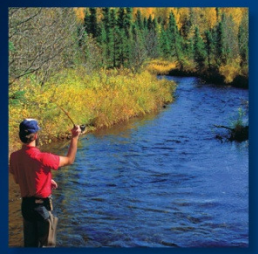


Hydrograph using Average of May 1981 to April 1984 for Starting Values



Comparison with historic information

- Kjelstrom's water budget (USGS PP-1408-C, 1995) estimated total recharge to the main part of the eastern Snake River Plain as follows:

Water Year	Recharge (MAF)
1975	6.74
1976	6.05
1977	4.18
1978	5.49
1979	5.91
1980	5.91

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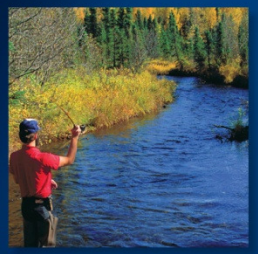
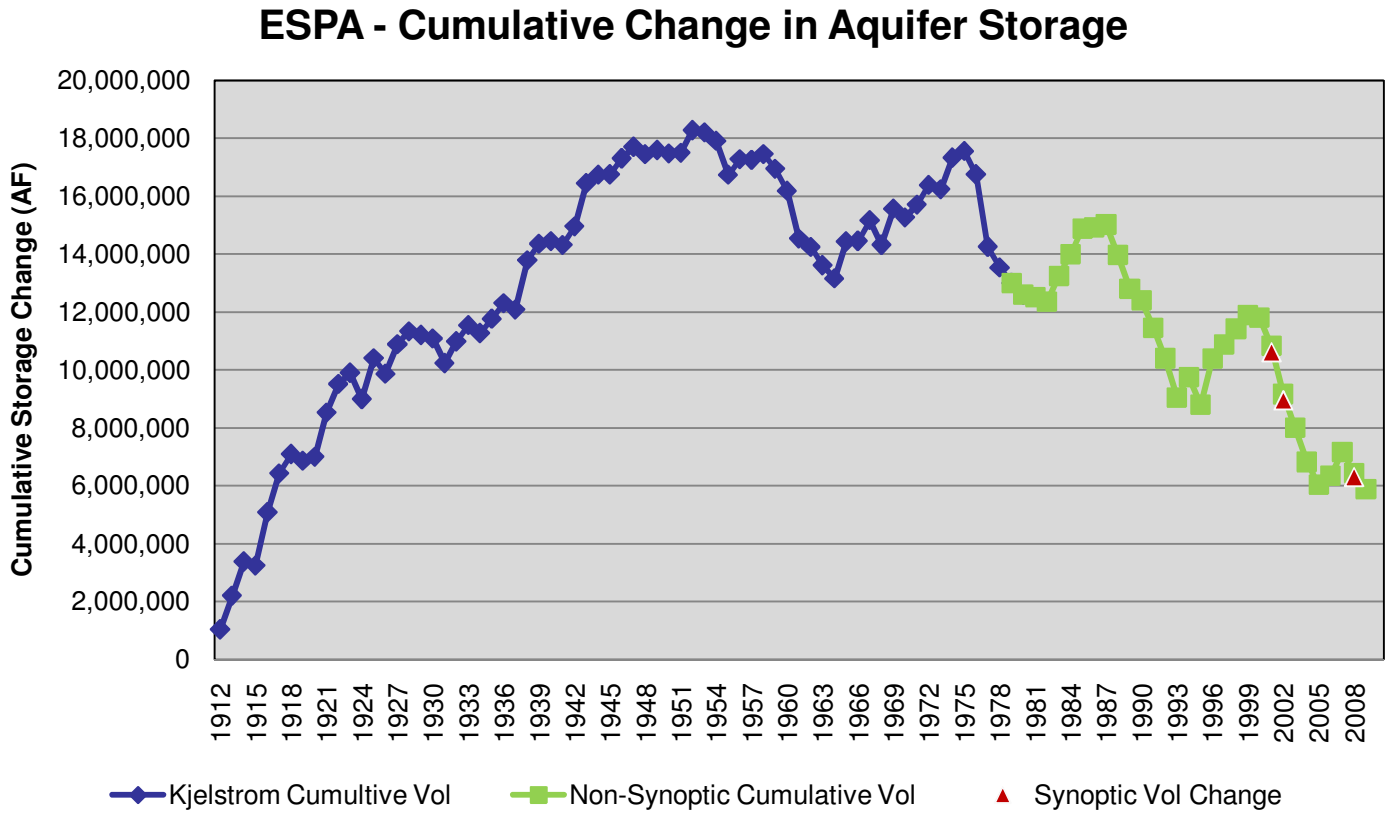


Comparison with historic information

- Low recharge in 1977 was followed by significant decline in water levels as illustrated by Mike McVay's aquifer storage estimates



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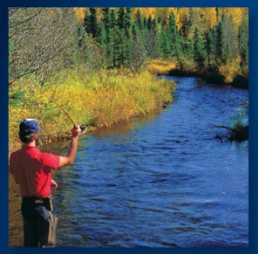
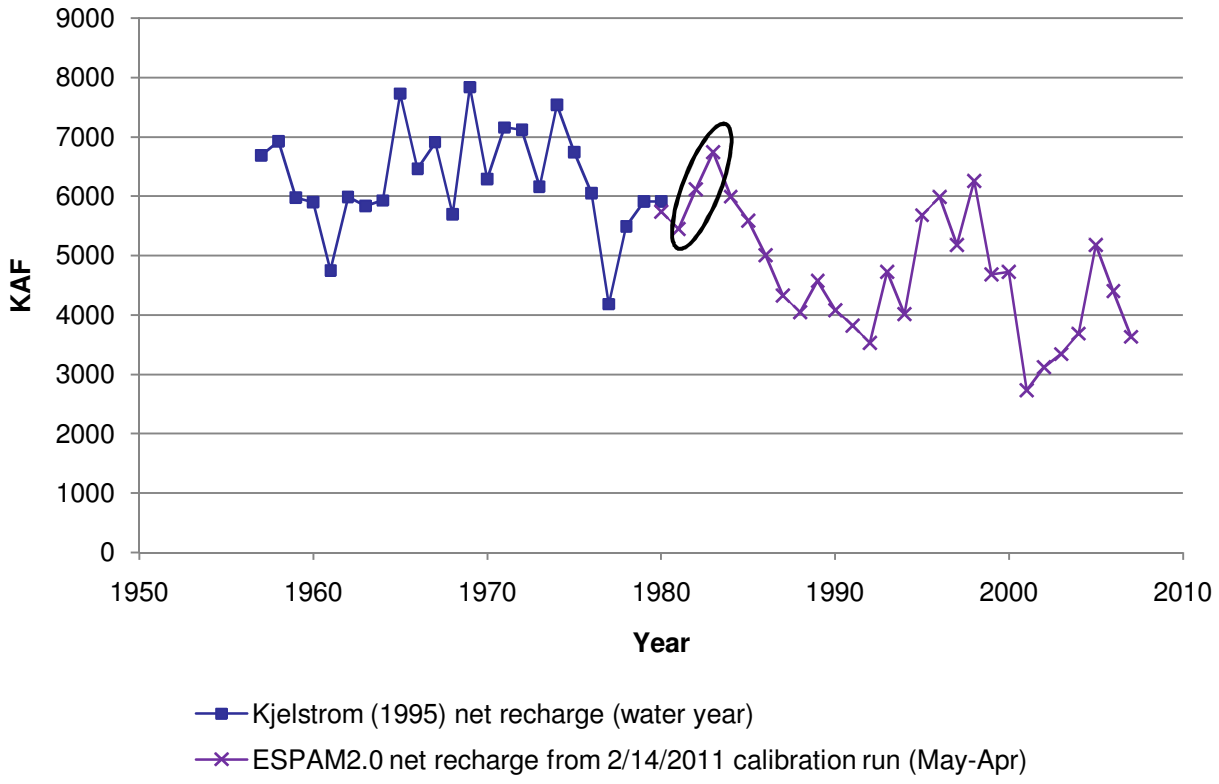
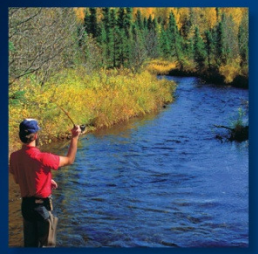


Comparison with historic information

- Recharge between May 1981 and April 1984 is high compared to the years immediately preceding the May 1980 starting date





Proposal

- Select water budget years from the model period with total recharge closer to average estimated recharge from 1976-1979 (5.4 MAF)
- Goal is to generate starting heads closer to actual May 1980 water levels
  - Note: MKMOD modifies recharge, so it's a moving target
- Annual recharge (May-April) from 2/14/2011 calibration run indicates May 1985 to April 1988 averages 5.0 MAF/yr
- PEST expected to increase MKMOD recharge in response to lower initial heads

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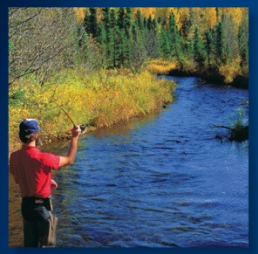

Proposal

Year (May-April)	MKMOD Recharge (MAF)
1980	5.7
1981	5.4
1982	6.1
1983	6.7
1984	6.0
1985	5.5
1986	5.0
1987	4.3
1988	4.0
1989	4.6

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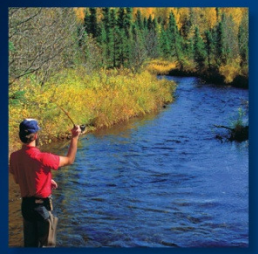

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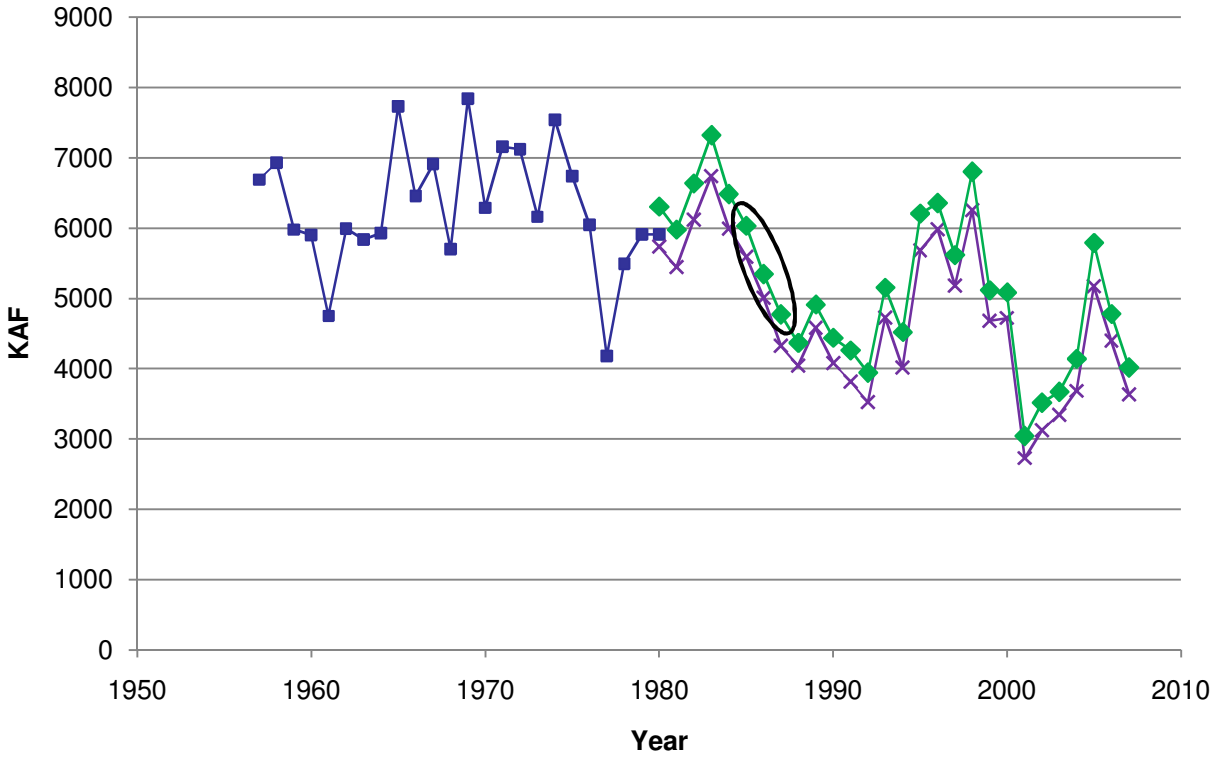

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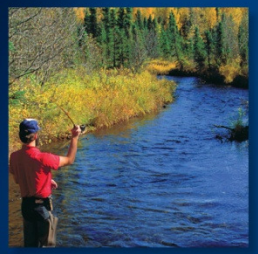

Results

- May 1985 to April 1988 average annual MKMOD recharge from 3/11/2011calibration run was 5.4 MAF
- Starting heads better represent 1980 conditions
- Decrease in aquifer storage (1980-2008) changed from 12 MAF (2/14/2011 calibration run) to 6 MAF (3/11/2001 calibration run)

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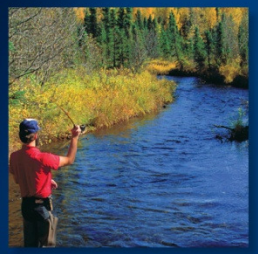

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